

102. (New) The method of claim 56 further comprising forming said MSMA-based compound from at least one styrene maleic anhydride copolymer and at least one fatty alcohol.

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## **II. RESPONSE TO OFFICE ACTION**

Claims 45, 46, 48, 53, 55, 65, 76 and 81 have been amended to even more particularly point out and distinctly claim the claimed subject matter, and new claims 93-103 have been added. Claims 37-49, 51-53, 55-74, 76-79, 81-82 and 85-102 are now pending.

Support for the amendments may be found in the claims as originally filed and throughout the Specification, for example, at page 56, lines 20-25; page 77, line 24 to page 78, line 2; page 83, line 28 to page 84, line 4. No new matter is added.

### **A. Telephone Interview with the Examiner**

Applicants wish to thank Examiner Tucker for discussing the outstanding Office Action with Applicants' representative, William W. Enders on January 7, 2003. During the interview, the outstanding claim rejections were discussed. Specifically, the Examiner indicated that claims 65-68, 70, 76 and 78 were rejected under 35 U.S.C. § 112 because structure (A) recited by each of then-pending independent claims 65 and 76 is not a partial monoester of styrene maleic anhydride.

### **B. The 35 U.S.C. § 112 Rejections**

The Examiner rejected claims 65-68, 70, 76, 78, 81 and 82 under 35 U.S.C. § 112 for various reasons. Applicants traverse these rejections for the following reasons.

Amended claims 65 and 76 recite MSMA-based formulas corresponding to partial monoesters of styrene maleic anhydride as described in the Specification. These claims are thus fully supported by the description contained in the Specification, as are claims 66-68, 70 and 78 which depend therefrom.

Amended claim 81 and 82 depend directly or indirectly from claim 77, which is currently pending in the application. These claims thus particularly point out and distinctly claim the subject matter to which they are directed.

In view of the above arguments, Applicants respectfully submit that the § 112 rejections should be withdrawn. Favorable reconsideration is requested.

**C. The 35 U.S.C. § 102 Rejections**

The Examiner rejected claims 45 and 48 under 35 U.S.C. § 102 over Morway and O'Halloran. Applicants traverse these rejections for the following reasons.

Prior to the present amendment, independent claims 45 and 48 were clear and definite as filed. However, to help facilitate prosecution, independent claim 45 has been amended so that this claim recites a method of forming a gelled organic-based fluid including *first* combining an organic base fluid with *a solid reaction product* of a carboxylic acid and a first metal source compound, *and then* combining a second metal source compound with the resulting combination of the organic base fluid and the solid reaction product to form the gelled organic fluid. Similarly, independent claim 48 has been amended so that this claim recites a method of forming a gelled organic-based fluid, including combining an organic base fluid with *a solid reaction product* of at least one carboxylic acid, a first metal source compound, and a second metal source compound to form the gelled organic fluid.

In order to support an anticipation rejection under 35 U.S.C. § 102(e), *each and every* element of the rejected claim must be found in the cited art” (*see* 35 U.S.C. Section 102)(emphasis added). Neither of the cited references disclose forming a gelled organic-based fluid using first and second metal sources and by combining an organic base fluid with *a solid reaction product* in the manner recited by claims 44 and 48. These claims are thus novel over the cited references.

Claims 45 and 48 are also non-obvious over the cited references. In this regard

claims 45 and 48 are *method* claims, and recite method steps of combining organic base fluids with solid reaction products that achieve surprising and unexpected results, *e.g.*, significant increase in operational efficiency (*see, for example*, the Specification at page 4, lines 4-16), increased stability of gelled fluids produced from non-refined organic base fluids, *etc.* Neither of the cited references, alone or in combination, discloses such advantages, nor teaches or suggests the claimed methodology.

Claims 45 and 48 are thus allowable over the cited references, and the 35 U.S.C. § 102 rejections be withdrawn. Favorable reconsideration is requested.

**D. Objected to Claims 46 and 47**

In the Office Action, the Examiner indicated that claims 46 and 47 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Amended independent claim 46 includes the limitations of independent claim 45 as it existed prior to this amendment. Claim 47 depends from amended claim 46. The Examiner indicated that claims 46 and 47 would be allowable if so amended. Therefore, Applicants submit that each of claims 46 and 47 are allowable. Favorable reconsideration is requested.

**E. New Claims 93-103**

New claims 93 and 94 depend from allowed claim 37, so that these claims are also allowable. New claims 97 and 98 depend from allowable amended claim 46, so that these claims are also allowable. New claim 101 depends from allowed claim 49, so that this claim is also allowable. New claim 102 depends from allowed claim 56, so that this claim is also allowable.

New claims 95 and 96 depend from amended claim 45, and new claims 99 and 100 depend from amended claim 48. Amended claims 45 and 48 have been shown to be allowable above, so that new claims 95, 96, 99 and 100 are also allowable. Furthermore, each of these dependent claims recite either introducing a gelled organic-based fluid into

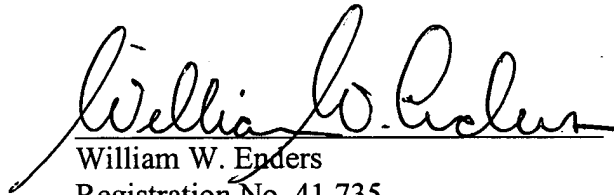
a wellbore, pipeline interior or fluid processing facility; or recite introducing a gelled organic-based fluid into a subterranean formation at a pressure above a fracturing pressure of the subterranean formation. In this regard, neither of the cited references disclose such limitations.

**F. Conclusion**

Applicants submit that claims 37-49, 51-53, 55-74, 76-79, 81-82 and 85-102 are in condition for allowance. Reconsideration of the application and claims is courteously solicited.

The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,

  
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AMENDMENTS TO THE CLAIMS  
SN 09/534,655

37. A method of forming a gelled organic-based fluid, comprising combining the following components to form said gelled organic fluid:

at least one organic base fluid, at least one carboxylic acid, at least one MSMA-based compound, and at least one first metal source compound.

38. The method of claim 37, wherein said first metal source compound comprises a salt of carboxylic acid.

39. The method of claim 37, wherein said combining comprises combining said organic base fluid and said MSMA-based compound with a solid reaction product of said carboxylic acid and said first metal source compound to form said gelled organic fluid.

40. The method of claim 42, wherein said multi-functional carboxylic acid comprises a dicarboxylic acid.

41. The method of claim 42, wherein said multi-functional carboxylic acid comprises a tricarboxylic acid.

42. The method of claim 37, wherein said carboxylic acid comprises at least one multi-functional carboxylic acid.

43. The method of claim 39, wherein said metal of said first metal source has a valence of +3.

44. The method of claim 43, wherein said first metal source compound comprises at least one of carboxylic acid salt, metal oxide, metal halide, metal hydroxide, metal alkoxide, metal sulfate, and wherein said metal of said first metal source compound is aluminum, iron, or a mixture thereof.

45. (Amended) A method of forming a gelled organic-based fluid, comprising [combining the following components to form said gelled organic fluid]:

[at least one organic base fluid, at least one carboxylic acid, and at least one first metal source compound;

wherein said carboxylic acid comprises at least one multi-functional carboxylic acid;

wherein said combining comprises] first combining an [said] organic base fluid with a solid reaction product of a [said] carboxylic acid and a [said] first metal source compound [to form said gelled organic fluid]; and

[wherein said combining further comprises] then combining a second metal source compound with said combination of said organic base fluid and said solid reaction product to form said gelled organic fluid;

wherein said carboxylic acid comprises at least one multi-functional carboxylic acid.

46. (Amended) [The method of claim 45,] A method of forming a gelled organic-based fluid, comprising combining the following components to form said gelled organic fluid:

at least one organic base fluid, at least one carboxylic acid, and at least one first metal source compound;

wherein said carboxylic acid comprises at least one multi-functional carboxylic acid;

wherein said combining comprises combining said organic base fluid with a solid reaction product of said carboxylic acid and said first metal source compound to form said gelled organic fluid;

wherein said combining further comprises combining a second metal source compound with said organic base fluid and said solid reaction product;  
and

wherein said metal of said first metal source has a valence of +3; and wherein said metal of said second metal source has a valence of +3.

47. The method of claim 46, wherein said first metal source compound comprises salt of carboxylic acid; wherein said second metal source compound comprises at least one of metal oxide, metal halide, metal hydroxide, metal alkoxide, metal sulfate or a mixture thereof; and wherein said metal of said first and second metal source compounds is aluminum, iron, or a mixture thereof.

48. (Amended) A method of forming a gelled organic-based fluid, comprising [combining the following components to form said gelled organic fluid]:

[at least one organic base fluid, at least one carboxylic acid, and at least one first metal source compound;

wherein said carboxylic acid comprises at least one multi-functional carboxylic acid;

wherein said combining comprises] combining an [said] organic base fluid with a solid reaction product to form said gelled organic fluid; [and]

wherein said solid reaction product comprises a reaction product of [said] at least one carboxylic acid, a [said] first metal source compound, and a second metal source compound.

49. A method of forming and using a gelled organic-based fluid, comprising:

combining at least one organic base fluid, at least one carboxylic acid, at least one first metal source compound, and at least one second metal source compound to form said gelled organic fluid; and

introducing said gelled organic fluid into a wellbore, pipeline interior or fluid processing facility;

wherein said first and second metal source compounds are different compounds;  
and

wherein said metal of said first metal source has a valence of +3; and wherein said metal of said second metal source has a valence of +3;



wherein said combining further comprises combining at least one MSMA-based compound with said organic base fluid, said first metal source and said second metal source compound to form said gelled organic fluid.

50. (Canceled)

51. A method of forming and using a gelled organic-based fluid, comprising:

combining at least one organic base fluid, at least one carboxylic acid, at least one first metal source compound, and at least one second metal source compound to form said gelled organic-based fluid; and

introducing said gelled organic-based fluid into a wellbore, pipeline interior or fluid processing facility;

wherein said first and second metal source compounds are different compounds;

wherein said metal of said first metal source has a valence of +3; and wherein said metal of said second metal source has a valence of +3; and

wherein said first metal source compound comprises salt of carboxylic acid; wherein said second metal source compound comprises at least one of metal oxide, metal hydroxide, metal halide, metal alkoxide, metal sulfate or a mixture thereof; and wherein said metal of said first and second metal source compounds is aluminum, iron, or a mixture thereof.

52. The method of claim 51, wherein said carboxylic acid comprises at least one fatty acid having from about 6 to about 24 carbon atoms; wherein said carboxylic acid salt

comprises aluminum octoate, aluminum stearate, iron octoate, or a mixture thereof; and wherein said second metal source compound comprises at least one of aluminum oxide, iron hydroxide, aluminum hydroxide, aluminum isopropoxide, aluminum chloride, ferric ammonium sulfate, or a mixture thereof.

53. The method of [any of] claim 52, further comprising combining with said organic base fluid a breaker material.

54. (Canceled)

55. (Amended) The method of claim 53, wherein said gelled organic-based fluid is introduced into a subterranean formation at a pressure above a fracturing pressure of said subterranean formation.

56. A method of forming a gelled organic-based fluid, comprising combining the following components to form said gelled organic fluid:

at least one organic base fluid;

at least one MSMA-based compound; and

at least one first metal source compound.

57. The method of claim 56, wherein said first metal source compound comprises salt of carboxylic acid; and wherein said metal of said first metal source compound is aluminum, iron, or a mixture thereof.

58. The method of claim 56, further comprising combining a carboxylic acid with said components to form said gelled organic fluid.

59. The method of claim 58, wherein said carboxylic acid comprises at least one multi-functional carboxylic acid.

60. The method of claim 59, wherein said carboxylic acid comprises citric acid.

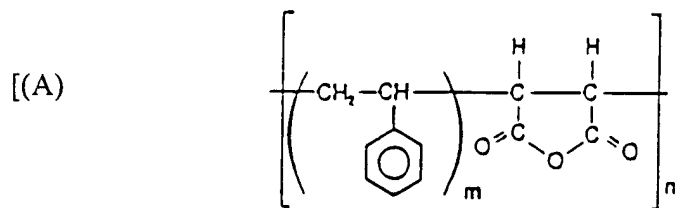
61. The method of claim 58, wherein said carboxylic acid comprises benzoic acid.

62. The method of claim 56, wherein said combining comprises first combining said MSMA-based compound and said first metal source compound to form a reaction product; and then combining said reaction product with said organic base fluid to form said gelled organic-based fluid.

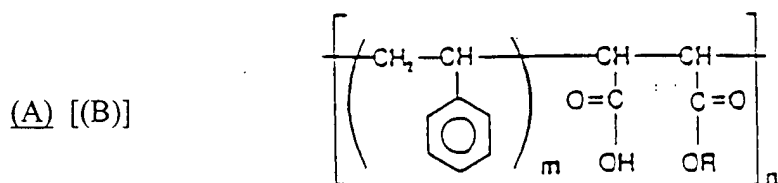
63. The method of claim 62, wherein said metal of said first metal source compound has a valence of +3.

64. The method of claim 63, wherein said reaction product comprises the reaction product of at least one carboxylic acid, said at least one MSMA-based compound, and said at least one first metal source compound.

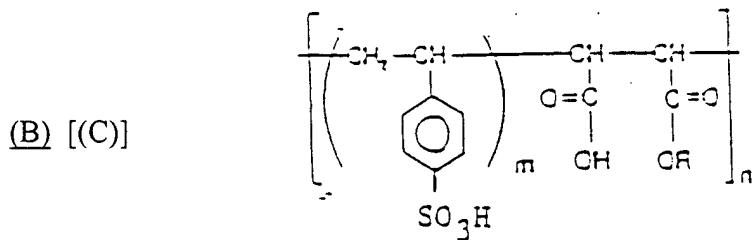
65. (Amended) The method of claim 64, wherein said MSMA-based compound has at least one of the following structures, or a mixture thereof:



wherein m = from about 1 to about 3; and n = from about 6 to about 8;]



wherein m = from about 1 to about 3; n = from about 6 to about 8; and R is a branched or straight carbon chain that may be saturated or unsaturated, and which has from about 8 to about 20 carbon atoms; or



wherein m = from about 1 to about 3; n = from about 6 to about 8; and R is a branched or straight carbon chain that may be saturated or unsaturated, and which has from about 8 to about 20 carbon atoms.

66. The method of claim 65, wherein said first metal source compound comprises at least one of carboxylic acid salt, metal oxide, metal halide, metal hydroxide, metal

alkoxide, metal sulfate, or mixture thereof; and wherein said metal of said first metal source compound is aluminum, iron, or a mixture thereof.

67. The method of claim 65, wherein said combining further comprises combining a second metal source compound with said organic base fluid, said at least one MSMA-based compound, and said at least one first metal source compound.

68. The method of claim 67, wherein said first metal source compound comprises salt of carboxylic acid; and wherein said second metal source compound comprises at least one of metal oxide, metal halide, metal hydroxide, metal alkoxide, metal sulfate or a mixture thereof; and wherein said metal of said first and second metal source compounds is aluminum, iron, or a mixture thereof.

69. The method of claim 64, wherein said carboxylic acid comprises at least one fatty acid having from about 6 to about 24 carbon atoms; and wherein said first metal source compound comprises aluminum octoate, aluminum stearate, iron octoate, aluminum 2,4-pentadione, iron 2,4-pentadione, aluminum oxide, iron hydroxide, aluminum hydroxide, aluminum isopropoxide, aluminum chloride, sodium hydroxide, ferric ammonium sulfate, or a mixture thereof.

70. The method of claim 68, wherein said carboxylic acid comprises at least one fatty acid having from about 6 to about 24 carbon atoms; wherein said carboxylic acid salt comprises aluminum octoate, aluminum stearate, iron octoate, or a mixture thereof; and wherein said second metal source compound comprises at least one of aluminum oxide, iron hydroxide, aluminum hydroxide, aluminum isopropoxide, aluminum chloride, ferric ammonium sulfate, or a mixture thereof.

71. The method of claim 57, wherein said combining further comprises combining at least one phosphate ester with said other components to form said gelled organic fluid.

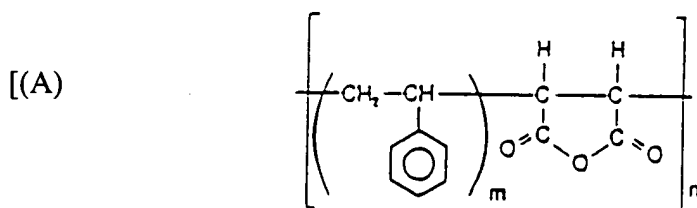
72. The method of claim 57, further comprising combining with said organic base fluid a breaker material.

73. The method of claim 57, further comprising introducing said gelled organic-based fluid into a wellbore, a pipeline interior, or a fluid processing facility.

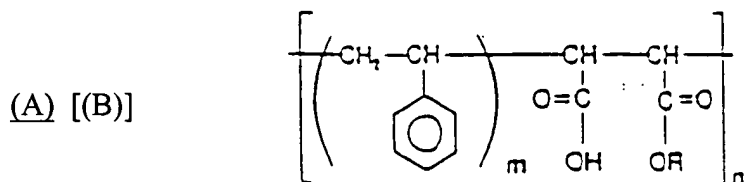
74. The method of claim 57, wherein said gelled organic-based fluid is introduced into a subterranean formation at a pressure above a fracturing pressure of said subterranean formation.

75. (Canceled).

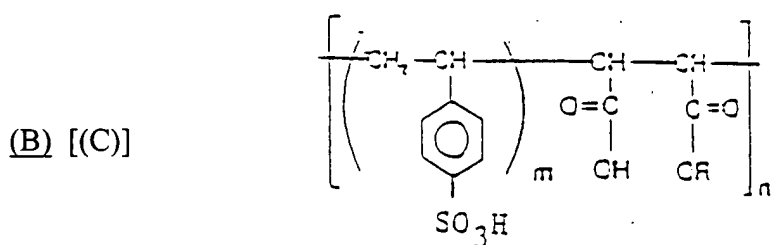
76. (Amended) The gelled organic fluid of claim 79, wherein said carboxylic acid comprises at least one fatty acid having from about 6 to about 24 carbon atoms; wherein said at least one metal source compound comprises aluminum octoate, aluminum stearate, iron octoate, aluminum 2,4-pentadione, iron 2,4-pentadione, aluminum oxide, iron hydroxide, aluminum hydroxide, aluminum isopropoxide, aluminum chloride, ferric ammonium sulfate, or a mixture thereof; and wherein said MSMA-based compound has at least one of the following structures, or a mixture thereof:



wherein m = from about 1 to about 3; and n = from about 6 to about 8;]



wherein m = from about 1 to about 3; n = from about 6 to about 8; and R is a branched or straight carbon chain that may be saturated or unsaturated, and which has from about 8 to about 20 carbon atoms; or



wherein m = from about 1 to about 3; n = from about 6 to about 8; and R is a branched or straight carbon chain that may be saturated or unsaturated, and which has from about 8 to about 20 carbon atoms.

77. The gelled organic fluid of claim 79, wherein said at least one metal source compound comprises a first and a second metal source compound, said first and second metal source compounds being different compounds.

78. The gelled organic fluid of claim 76, wherein said reaction product comprises a solid reaction product having a particle size of from about 100 mesh to about 325 mesh.

79. A gelled organic fluid formed by combining an organic base fluid with a reaction product of at least one carboxylic acid, at least one metal source compound, and at least one MSMA-based compound.

80. (Canceled).

81. (Amended) The gelled organic fluid of claim 77 [83] wherein said carboxylic acid comprises at least one fatty acid having from about 6 to about 24 carbon atoms; wherein said [at least one] first metal source compound comprises a carboxylic acid salt that is at least one of aluminum octoate, aluminum stearate, iron octoate, or a mixture thereof; and wherein said [at least one] second metal source compound comprises at least one of aluminum oxide, iron hydroxide, aluminum hydroxide, aluminum isopropoxide, aluminum chloride, ferric ammonium sulfate, or a mixture thereof.

82. The gelled organic fluid of claim 81, wherein said reaction product comprises a solid reaction product having a particle size of from about 100 mesh to about 325 mesh.

83. (Canceled)

84. (Canceled)

85. A gelled organic-based fluid formed from components comprising:

at least one organic base fluid;



at least one MSMA-based compound; and

a first metal source compound.

86. The gelled organic-based fluid of claim 85, wherein said gelled organic-based fluid is formed from components further comprising a carboxylic acid.

87. A method of forming a gelled organic-based fluid, comprising combining the following components to form said gelled organic fluid:

at least one organic base fluid, at least one MSMA-based compound, at least one carboxylic acid, at least one first metal source compound, and at least one second metal source compound;

wherein said first and second metal source compounds are different compounds.

88. The gelled organic-based fluid of claim 86, wherein said gelled organic-based fluid is formed from components comprising at least one organic base fluid, at least one carboxylic acid, at least one first metal source compound, and at least one second metal source compound; wherein said first and second metal source compounds are different compounds.

89. The method of claim 37, wherein said gelled organic-based fluid is a non-phosphate gelled organic-based fluid.

90. The method of claim 56, wherein said gelled organic-based fluid is a non-phosphate gelled organic-based fluid.

91. The gelled organic fluid of claim 79, wherein said gelled organic fluid is a non-phosphate gelled organic fluid.

92. The gelled organic-based fluid of claim 85, wherein said gelled organic-based fluid is a non-phosphate gelled organic-based fluid.